

ESTIMATE OF STRUCTURE QUANTITIES

DESCRIPTION	QUANTITY	UNIT	REMARKS
Bridge Elevation Survey	Lump Sum	LS	
Concrete Penetrating Sealer	375.1	SqYd	See Special Provision
Incidental Work, Structure	Lump Sum	LS	
Structural Steel, Miscellaneous	Lump Sum	LS	
Membrane Sealant Expansion Joint	67.8	Ft	
Structure Excavation, Bridge	213	CuYd	
Bridge End Embankment	287	CuYd	
Granular Bridge End Backfill	62.8	CuYd	
Approach Slab Underdrain Excavation	6.0	CuYd	
Precast Concrete Headwall for Drain	4	Each	
Class A45 Concrete, Bridge Deck	126.8	CuYd	
Class A45 Concrete, Bridge	100.0	CuYd	
Concrete Approach Slab for Bridge	154.1	SqYd	
Concrete Approach Sleeper Slab for Bridge	33.9	SqYd	
Deck Drain, Girder Bridge	8	Each	
Controlled Density Fill	7.2	CuYd	
Reinforcing Steel	16,292	Lb	
Epoxy Coated Reinforcing Steel	26,002	Lb	
No. 14 Rebar Splice	28	Each	
Preboring Pile	120	Ft	
HP 12x53 Steel Test Pile, Furnish and Drive	290	Ft	
HP 12x53 Steel Bearing Pile, Furnish and Drive	2,175	Ft	
36" Minnesota Shape Prestressed Concrete Beam	416	Ft	
4" Underdrain Pipe	252	Ft	
Porous Backfill	30.0	Ton	
Class B Riprap	868.2	Ton	
Type B Drainage Fabric	894	SqYd	

SPECIFICATIONS FOR BRIDGE

- 1. Design Specifications: AASHTO LRFD Bridge Design Specifications, 2017 Edition.
- 2. Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications, and special provisions as included in the proposal.

BRIDGE DESIGN LOADING

- 1. AASHTO HL-93.
- 2. Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS*

Concrete f'c = 4,500 psiReinforcing Steel fy = 60,000 psiPiling (ASTM A572 Grade 50) fy = 50,000 psi

*For prestressed beams, see notes regarding Prestressed Girders.

GENERAL CONSTRUCTION

- 1. All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- 2. All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise.
- 3. Use 2" clear cover on all reinforcing steel except as shown.
- 4. Contractor shall imprint on the structure the date of new construction as specified and detailed on Standard Plate No. 460.02.
- 5. Barrier Curbs and End blocks shall be built normal to the grade.
- 6. Request for construction joints or resteel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of resteel.
- 7. The elevation of the bridge deck is 18" above subgrade elevation.

INCIDENTAL WORK, STRUCTURE

- 1. In place centerline Sta. 21+31.00 to centerline Sta. 22+46.00 is a 117'-0" 5 span continuous concrete bridge with a 24'-0" clear roadway. The superstructure consists of a reinforced concrete slab with W-Beam railing. The deck has been overlaid with 1.5 inches of Latex Modified Concrete. The substructure consists of 2 column reinforced concrete bents and reinforced concrete vertical abutments, all of which are supported on timber piling.
- 2. Break down and remove the existing bridge, including the concrete slope protection, timber piles and approach/sleeper slabs if applicable, to 1 foot below finished groundline, or as required to construct the new structure in accordance with Section 110 of the Specifications. All portions of the existing bridges shall be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the COMMITMENT H: WASTE DISPOSAL SITE notes found in Section
- 3. The foregoing is a general description of the in-place bridge and should not be construed to be complete in all details. Before preparing the bid it shall be the responsibility of the Contractor to make a visual inspection of the structure to verify the extent of the work and materials involved. If desired by the Contractor, a copy of the original construction plans may be obtained through the Office of Bridge Design.

DESIGN MIX OF CONCRETE

- All structural concrete shall be Class A45 unless otherwise indicated.
- 2. Type II cement is required, except Type III may be used for the prestressed beams.
- 3. Grout design mix shall be as specified in Section 460.2 K of the Specifications. A compressive strength of 2000 psi shall be attained by the grout prior to erection of any beams. Chamfer edges of grout pads 3/4". The quantity of grout is included in and shall be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

ABUTMENTS

- 1. Preboring piling at abutments is required to whichever is greater, ten feet or to natural ground.
- 2. The HP 12x53 Piling were designed using a factored bearing resistance of 98 tons per pile. Piling shall develop a field verified nominal bearing resistance of 245 tons per pile.
- 3. One test pile shall be driven at each abutment and will become part of the pile group.
- 4. The Contractor shall have sufficient pile splice material on hand before driving is started. See Standard Plate No. 510.40.
- 5. Piles shall not be driven out of position by more than three inches in the direction normal to the abutment centerline. A pile-driving template shall be used to insure this accuracy.
- 6. Abutment backwalls above the construction joint may be cast separately from the deck slab. The concrete used for the backwalls and wings shall be Class A45 Concrete, Bridge. All abutment and bridge deck concrete shall have attained design strength prior to backfilling.
- 7. Each finished abutment shall include a Bridge Survey Marker. See Standard Plate No. 460.05.

ABUTMENT BACKWALL COATING

The material for waterproofing the abutment backwall shall be one of the products from the approved products list. The acceptable abutment backwall coating suppliers are listed on the approved products list at the following Internet address:

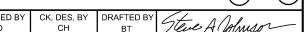
http://apps.sd.gov/applications/HC60ApprovedProducts/ProductList.aspx

The cost of furnishing and applying the coating shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge.

REQUIRED LIST **Title Block Project Block Estimate of Quantities** Notes

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES 106' - 6" PRESTR. GIRDER BRIDGE

> STR. NO. 30-132-080 MARCH 2018



DESIGNED BY

STATE OF Sheet TOTAL SHEETS S.D. STATE OF SHEETS

3 BENT

- 1. The HP 12x53 Piling were designed using a factored bearing resistance of 98 tons per pile. Piling shall develop a field verified nominal bearing resistance of 245 tons per pile.
- 2. One test pile shall be driven at the bent and will become part of the pile group.
- 3. The Contractor shall have sufficient pile splice material on hand before pile driving is started. See Plate No. 510.40.
- 4. Spiral reinforcement may be fabricated from cold drawn wire conforming to ASTM A1064 or hot rolled plain or deformed bars conforming to the strength requirements of ASTM A615. Grade 60.

COFFERDAMS

- It is anticipated that cofferdams will be necessary. Cofferdams shall be designed and constructed in accordance with Section 423 of the Specifications.
- 2. The design of the Cofferdam must be done by Professional Engineers registered in South Dakota. Sealed calculations of both the original design and design check, performed by different engineers, shall be submitted with the cofferdam plans. The cofferdam plans, design, and design check shall be submitted to the Office of Bridge Design a minimum of 15 days prior to Cofferdam construction.

PRESTRESSED GIRDERS

- 1. Minimum concrete compressive strength f'c = 6000 psi at 28 days for all girders, f'ci = 5000 psi for all Girders.
- 2. All mild reinforcing steel shall be deformed bars conforming to ASTM A615, Grade 60.
- Individual tendons in all pretensioned sections shall consist of seven wire uncoated Type 270K Strands having a nominal diameter of 0.6" and a minimum ultimate strength of 58600 lbs. per cable. An initial tensile force of 43500 lbs. shall be applied to all 0.6" cables in all girders. All prestressing steel shall conform to AASHTO M203. (low lax strands).
- 4. All prestressed girders within a span shall be cast within an 8 day period. If not, the newest girder shall be at least 6 weeks old before the deck slab is poured. The girders shall be poured in all steel forms.
- 5. Prestressed concrete girders shall always be lifted by the devices provided in the top flanges near the ends of the girders. Types of lifting devices other than those shown on the plans may be used provided they are approved by the Office of Bridge Design. The design of the lifting devices shall be the responsibility of the Fabricator.
- 6. Each beam shall be marked showing structure number, casting date, and beam number. Marking shall be on the face of the beam near the end and so located that they will be exposed after the diaphragms have been cast. Facia beams shall be marked on an inside face. All markings shall be stenciled and clearly legible. For beam designations and locations, see superstructure layout plan and Erection Data sheet.

- 7. The physical properties of the elastomeric bearing pads shall conform to the requirements of Section 18.2 of the AASHTO LFRD Bridge Construction Specification and the AASHTO Materials Specification M251. The elastomeric bearing pads shall conform to Grade 60 (durometer). The cost of the pads shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge. Certification that pads are 60 durometer and meet the requirements of AASHTO LFRD Bridge Construction Specification Section 18.2 and AASHTO Materials Specification M251 shall be furnished to the Engineer with the shop drawings. No laminated bearing pads will be allowed.
- 8. All exposed corners shall be chamfered 3/4" or rounded to 3/4" radius.
- Dead Load of girder taken as effective at transfer. Cut strands, except those extended and bent, flush with end of girder and coat end of strands with mortar.
- 10. The Contractor shall be responsible for ensuring that transportation stresses, handling and erection do not cause damage to the girders.
- 11. Furnish and Install Inserts for T8 Rebars as shown in the plans. All costs involved shall be incidental to the contract unit price per foot of girder.

SUPERSTRUCTURE

- 1. Girder lifting hooks shall be cut off before placement of concrete deck slab.
- 2. The diaphragms at the bent shall be poured integrally with the deck slab. Placement of diaphragms at the bent shall not slow down the rate of deck concrete placement and finishing. The Contractor shall place the concrete for the specified diaphragm ahead of the deck concrete in such a manner that advancement of the deck concrete reaches the diaphragm just as placement of concrete in the diaphragm is complete.
- 3. The deck-finishing machine shall be adjusted and operated in such a manner that the roller screed or screeds are parallel with the centerline of the bridge and the finish machine is parallel to the skew of the bridge. Concrete placement in front of the finish machine shall be kept parallel to the machine.
- 4. The bridge deck must be placed and finished continuously at a minimum rate of 43 ft. of deck per hour measured along Centerline Roadway. This rate is exclusive of concrete placed in the diaphragms. (See note 2 above.) If concrete cannot be placed and finished at this rate, the Engineer shall order a header installed and operations stopped. Notify the Bridge Construction Engineer if deck pour operations are stopped. Operations may resume only when the Engineer is satisfied that a rate of 43 ft. of deck per hour can be achieved and the concrete in the previous pour has attained a minimum compressive strength of 2000 psi.

- 5. Snap ties, if used in the barrier curb formwork, shall be epoxy coated. The epoxy coating shall be inert in concrete and compatible with the coating applied to the new epoxy coated reinforcing steel.
- 6. See Special Provision for Concrete Penetrating Sealer.

FALL PROTECTION

- The Contractor shall install a Fall Protection System conforming to OSHA Regulations. When working on the girders prior to decking installation, a Horizontal Lifeline – or other OSHA approved system shall be installed. The Contractor shall have one Personal Fall Arrest System (PFAS) available for use by a Department Inspector. The PFAS shall be compatible with the installed Fall Protection System.
- 2. Modifications to any bridge components used to accommodate the Fall Protection System shall be shown on the Falsework Plans and/or the appropriate Shop Plans. Field welding to bridge components will not be allowed. Field placed concrete inserts or drilled-in anchor bolts will be allowed if approved by the Engineer. All costs associated with providing the Fall Protection System shall be incidental to the other contract items.

USGS STREAM GAGE

A USGS gauging station is located on the existing bridge and will be removed or relocated by the USGS. The Contractor shall coordinate the removal or relocation of this station with the USGS. A minimum of two weeks notice shall be given to the USGS prior to any work involving the stream gauging station. Contact the U.S. Geological Survey, Water Resource Division, Huron Programs Office, 111 Kansas Avenue SE, Huron, SD 57350. Nathan Stevens (605)352-4241.





106' - 6" PRESTR. GIRDER BRIDGE

STR. NO. 30-132-080 MARCH 2018

SIGNED BY	CK. DES. BY	DRAFTED BY	(+ 1)1
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DECK DRAIN, GIRDER BRIDGE

- 1. Deck Drains shall be 4" diameter x 4' 1" Schedule 40, Acrylonitrile Butadine-Styrene (ABS) Plastic Pipe conforming to the requirements of ASTM D2661 or Schedule 40 ABS Plastic Pipe conforming to the requirements of ASTM F628.
- 2. The 4 1/2" diameter by 1" ABS Plastic Pipe Sleeves can be made from a 4-inch diameter (ABS) Pipe Coupler. They shall be attached to the 4-inch diameter (ABS) Plastic Pipe as shown in the plans with a solvent cement conforming to ASTM-D2235.
- 3. The 1/2 inch diameter U-bolts, nuts and washers shall conform to ASTM A307 and shall be galvanized in accordance with ASTM F2329.
- 4. Steel for the bent plates and washers shall conform to ASTM A709, Grade 36 and shall be galvanized in accordance with ASTM A123. Washers shall be plate washers or a continuous bar at least 5/16" thick with standard holes and shall have a size sufficient to completely cover the slot after installation.
- 5. The 1/2 inch diameter bolts and nuts shall conform to ASTM A307 and shall be galvanized in accordance with ASTM F2329.
- 7. The deck drain to girder connection as shown allows the deck drain location to be adjusted slightly to clear transverse slab steel.
- 7. After the deck drains have been installed, the ABS plastic pipe and attaching hardware shall be painted with Aluminum Filled Epoxy Mastic Primer, gray in color, conforming to Section 411 of the Specifications. Prior to paint application, the ABS plastic pipe shall be sanded to produce a roughened surface sufficient for paint adhesion.
- 8. Payment for deck drains shall be at the contract unit price per each for Deck Drains, Girder Bridge, and shall be full compensation for furnishing, fabricating, installing and painting the deck drains and all attaching hardware in accordance with the plans and specifications.

PILING DRIVING

1. A drivability analysis was performed using the wave equation analysis program (GRLWEAP). The following pile hammers were evaluated and found to produce acceptable driving stresses:

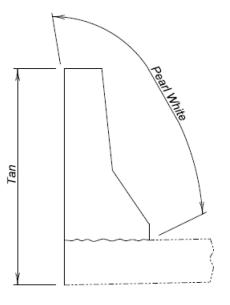
Delmag D25-32 APE D30-52 Delmag D30-32 SPI D30

2. Pile hammers not listed will require evaluation and approval prior to use from the Geotechnical Engineering Activity.

CLASS B COMMERCIAL TEXTURE FINISH

- A Class B commercial texture finish shall be applied to the following areas:
 - a. Barrier Rail: all exposed surfaces (front, top and back).
 - b. Slab: edge of slab.

- 2. The Class B commercial texture finish shall be applied in accordance with Section 460.3 L.1.c of the Specifications.
- 3. Where the Class B commercial texture finish is to be applied, concrete curing shall be accomplished with cotton or burlap mats and polyethylene sheeting. Curing shall continue for not less than seven days after placing concrete before the commercial texture finish is applied. The commercial texture finish shall be applied in accordance with the manufacturer's recommendations. The commercial texture finish itself does not require a specific cure except for drying.



APPROACH SLABS

- 1. Sleeper slab riser shall be cast with the approach slab or cast after the approach slab is placed. Care shall be taken to ensure the correct grade is maintained across the joint.
- 2. The portion of the sleeper slab below the construction joint may be precast. If the bottom portion of the sleeper slab is precast, the Contractor shall submit proposed lifting and setting plans to the Bridge Construction Engineer for approval. In addition, if reinforcing or other details differ from those shown in the plans, the Contractor shall submit proposed alternate details for approval.
- 3. The use of an approved finishing machine will be required during placement of Class A45 Concrete for the approach slabs. Concrete placement in front of the machine shall be kept parallel to the screed.
- 4. The concrete in the approach slab shall be tined normal to centerline roadway.
- 5. Concrete Approach Sleeper Slab for Bridge, whether cast-in-place or precast, will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete and reinforcing steel; for disposal of all excavated material and surplus materials; and for labor, tools, equipment and any incidentals necessary to complete this item of work.

STATE	PROJECT	SHEET	TOTAL
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6. Concrete Approach Slab for Bridge will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling and placing all materials including concrete, asphalt paint or 6 mil polyethylene sheeting, elastic joint sealer and reinforcing steel; for disposal of all excavated material and surplus materials and for labor, tools, equipment and any incidentals necessary to complete this item of work.

AS - BUILT ELEVATION SURVEY

The Contractor shall be responsible for recording the As-built deck elevations and bridge survey marker elevations at the locations shown in the Table of As-Built Elevations shown in the plans. All costs associated with obtaining the elevations including all equipment, labor and any incidentals required shall be incidental to the contract lump sum price for Bridge Elevation Survey.



1)Title Block
2)Project Block

3 Notes

NOTES (CONTINUED)

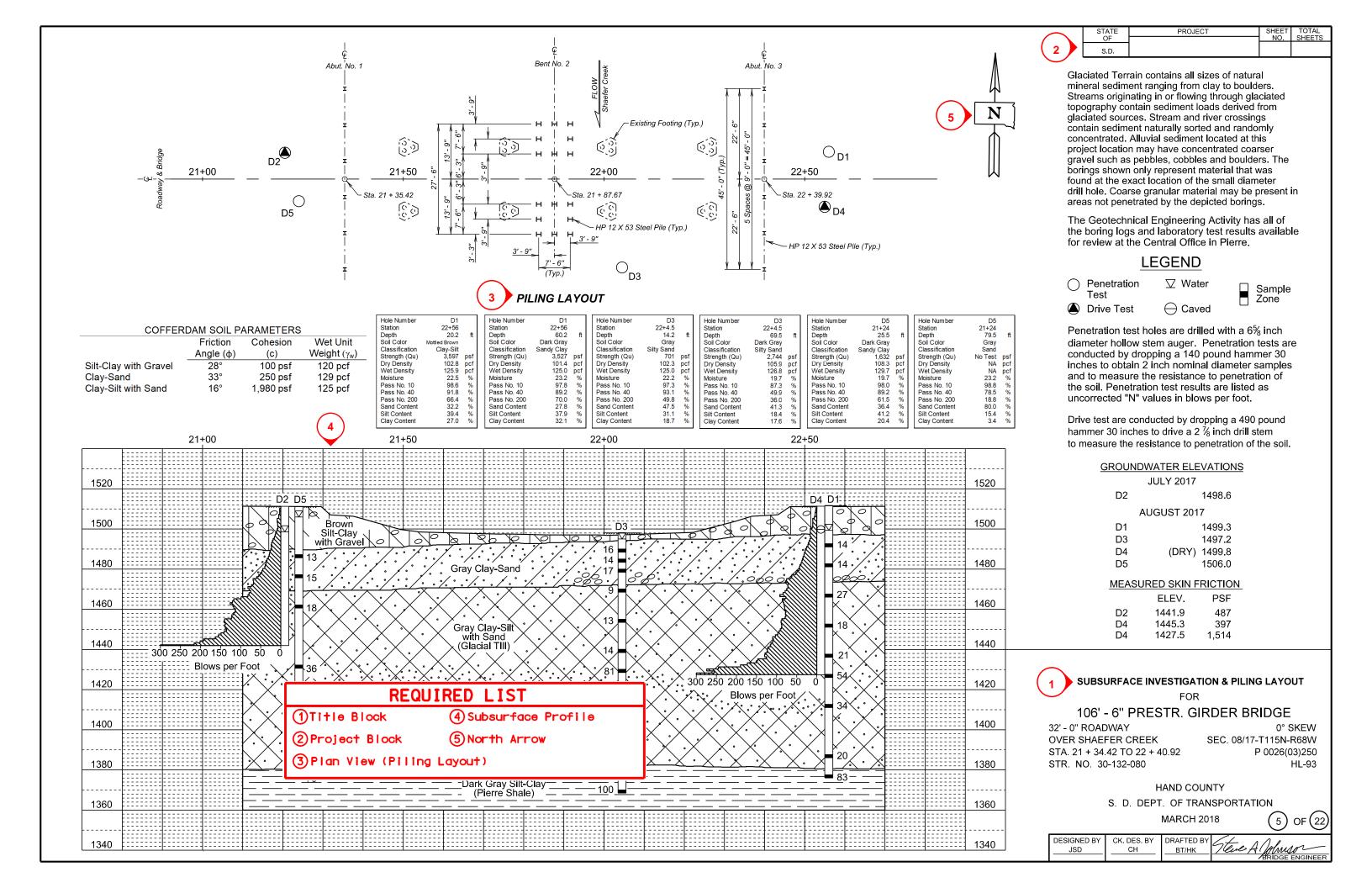
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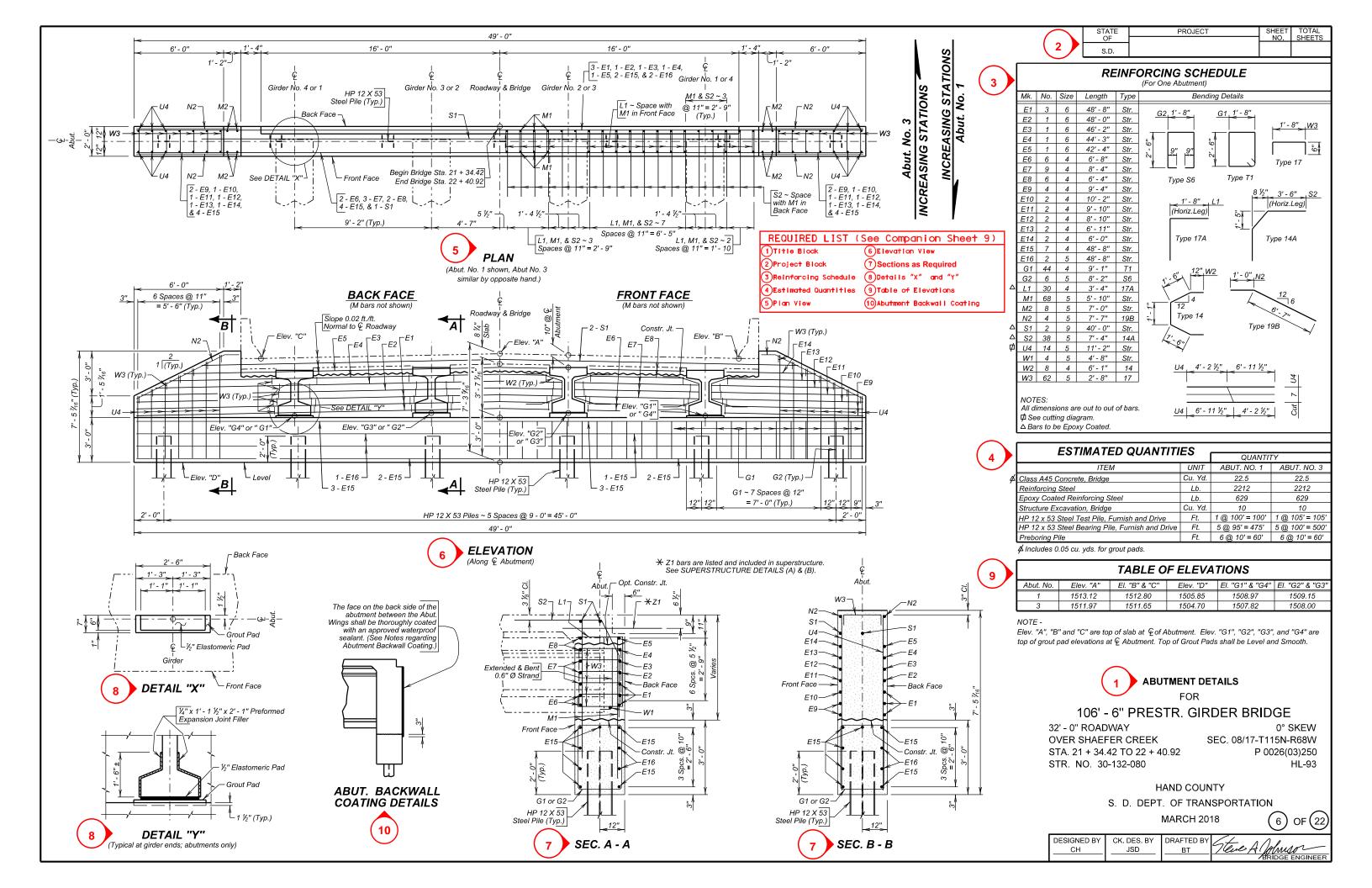
106' - 6" PRESTR. GIRDER BRIDGE

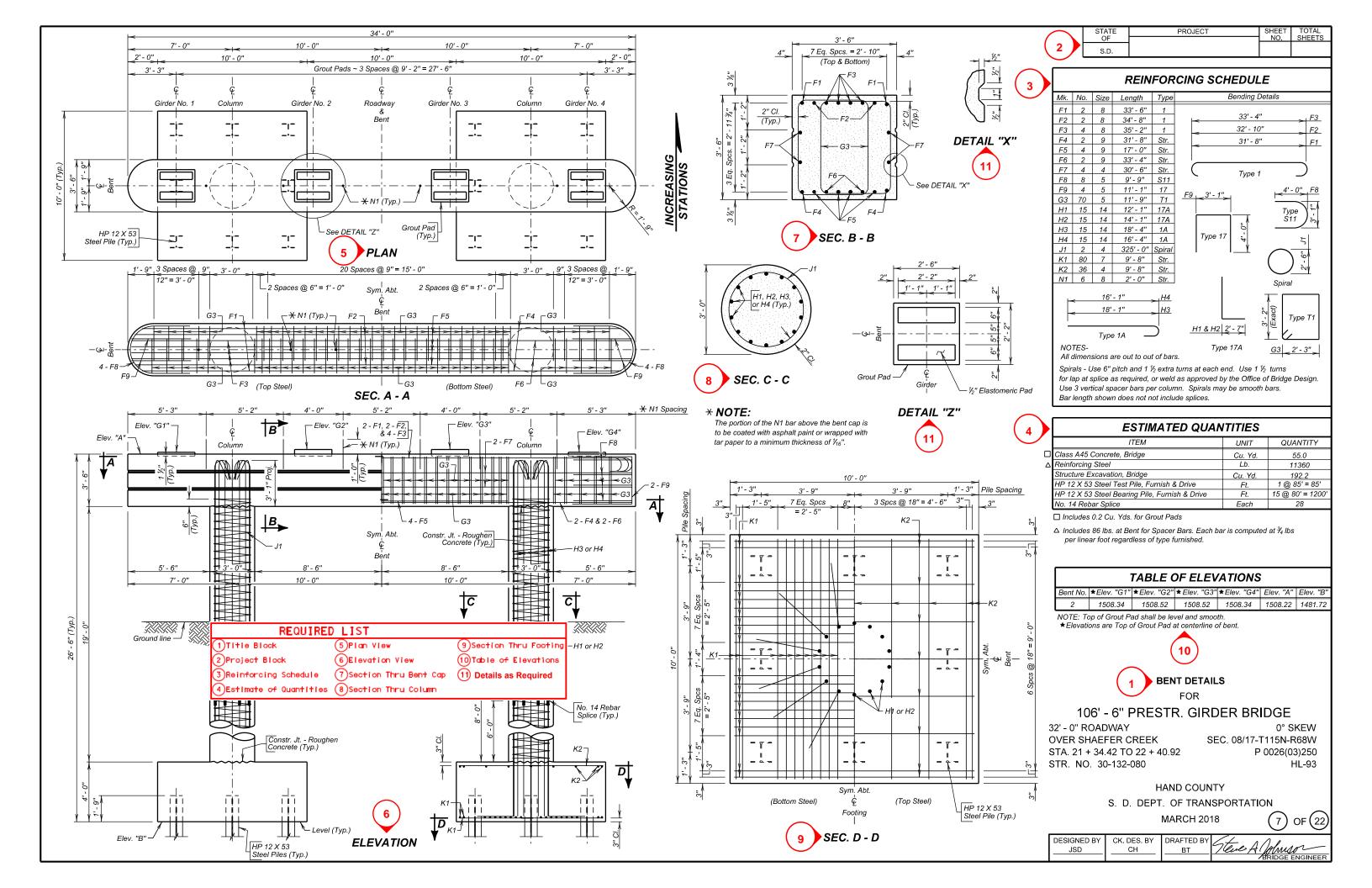
STR. NO. 30-132-080 MARCH 2018

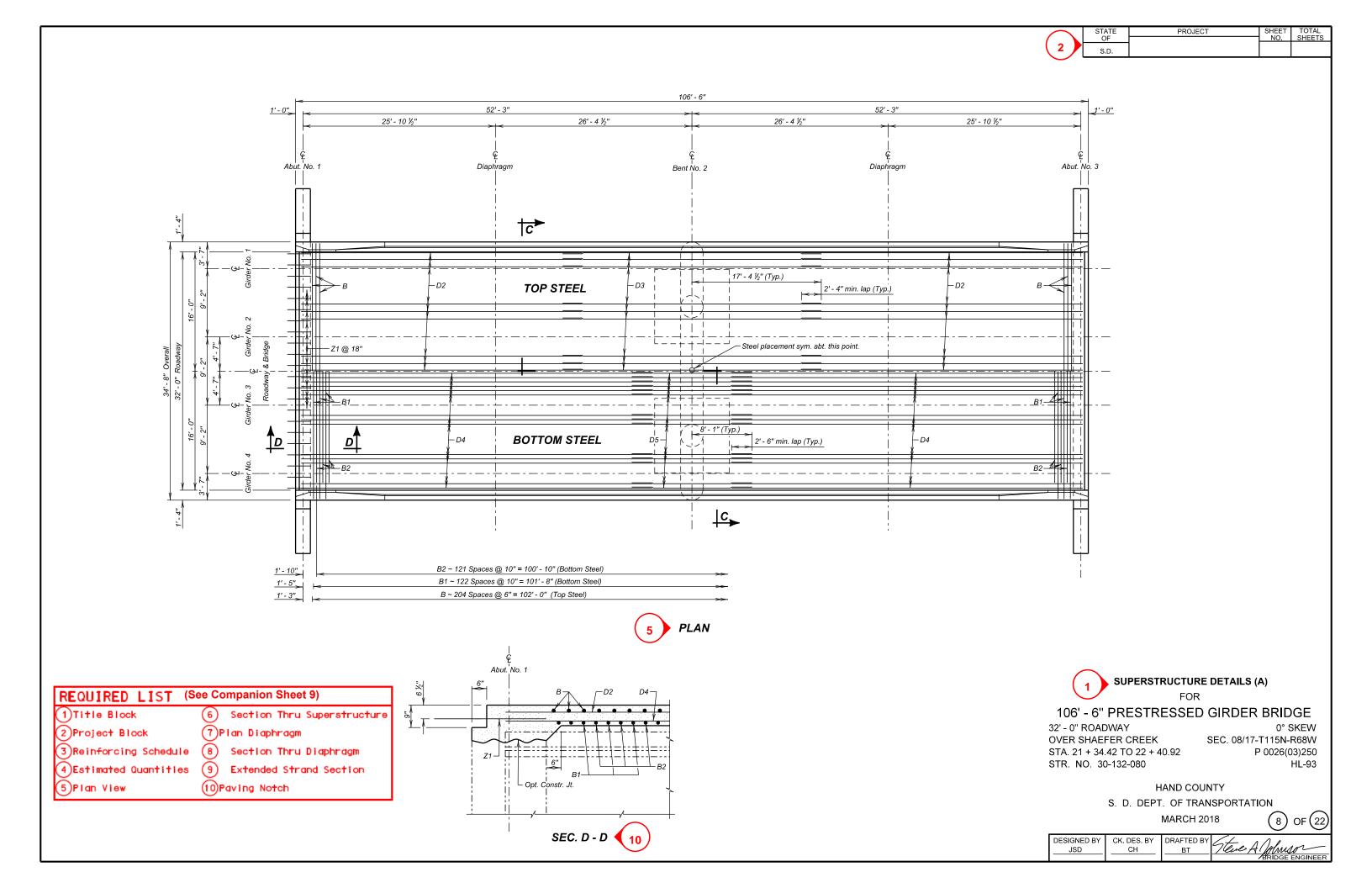
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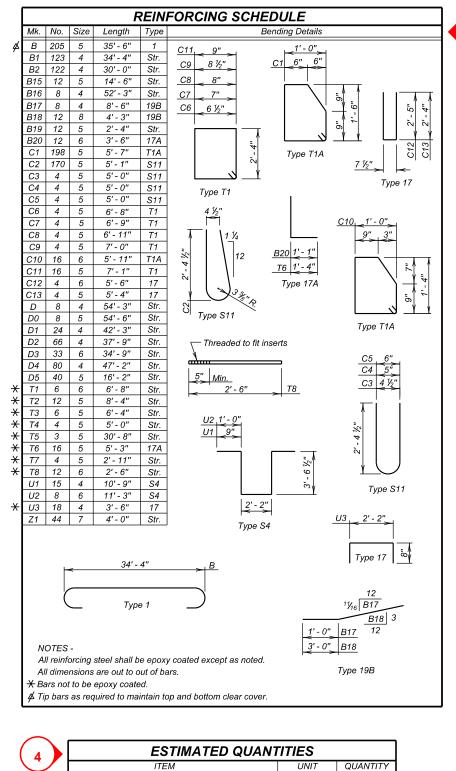
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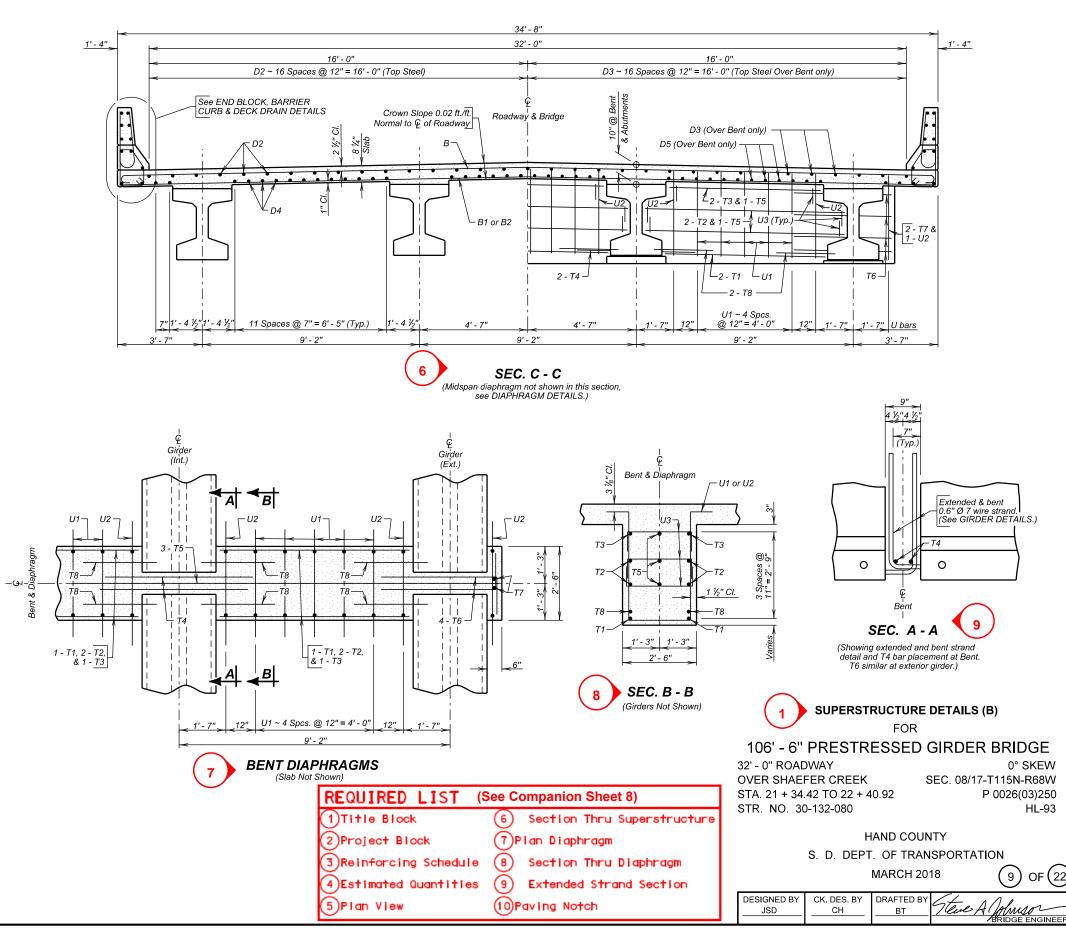
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ESTIMATED QUANTITIES								
	ITEM	UNIT	QUANTITY					
☆	Class A45 Concrete, Bridge Deck	Cu.Yd.	126.8					
ø	Epoxy Coated Reinforcing Steel	Lb.	24744					
ø	Reinforcing Steel	Lb.	508					
	36" Minnesota Shape Prestressed Concrete Beam	Ft.	416					
	Concrete Penetrating Sealer	Sq.Yd.	375.1					

- ☐ Includes quantities for Bent Diaphragm, Barrier Curbs, and Slab.
- ☆ Includes quantities for Bent Diaphragm, Barrier Curbs, Slab, and Haunch. (Average depth of 1 \(\frac{\gamma}{\gamma} \) used for Haunch Quantity.) Concrete Quantity for Barrier Curbs is 0.0842 Cu.Yd. / Ft. and for End blocks is 1.1659 Cu.Yd. each.

NOTE -

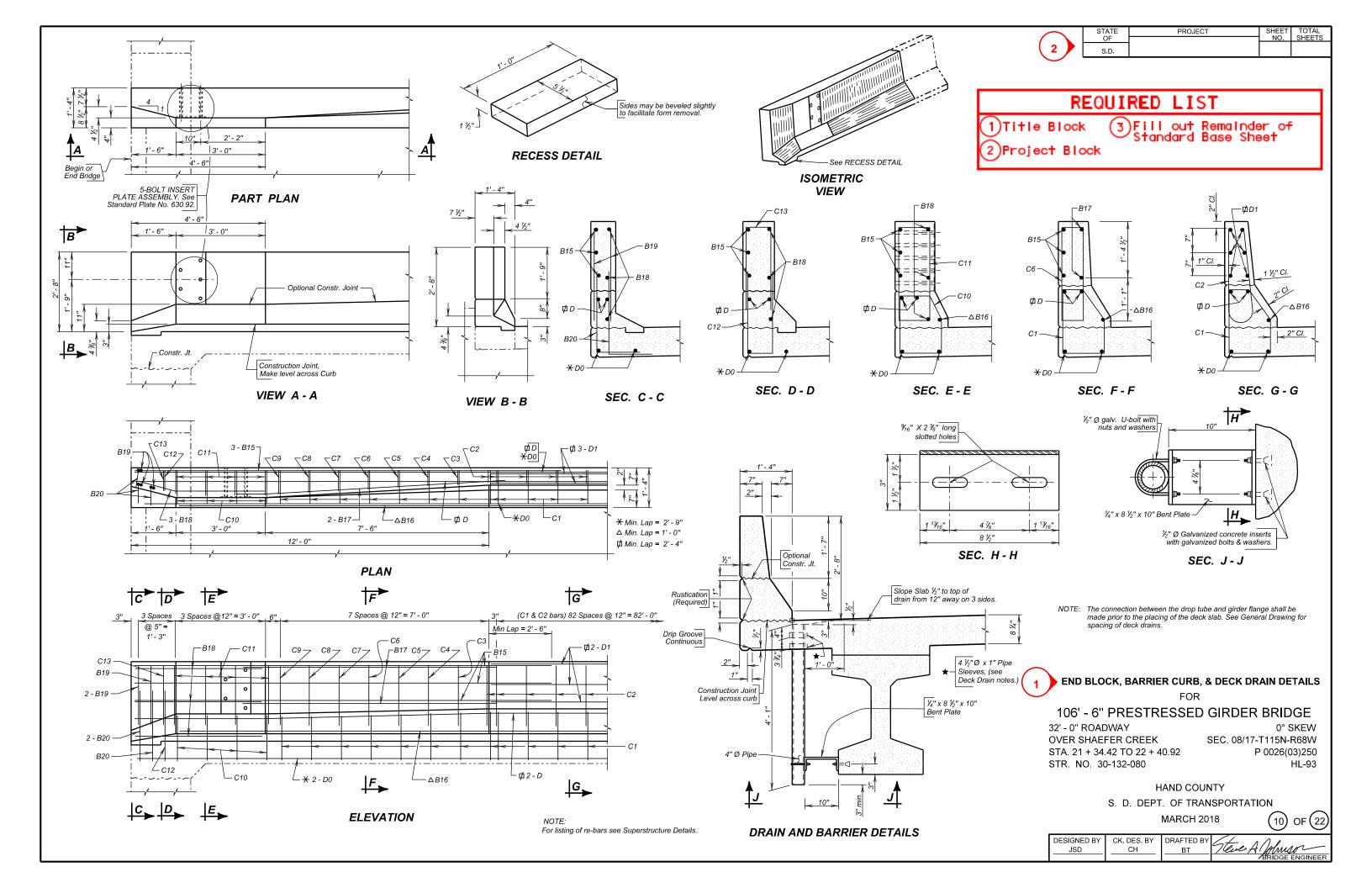
Concrete shall be placed in the space under the beams at Bent 2 (within the diaphragm width) during the diaphragm pour. If upon form removal the space is not completely filled and consolidated, the contractor shall grout in the remaining voids.

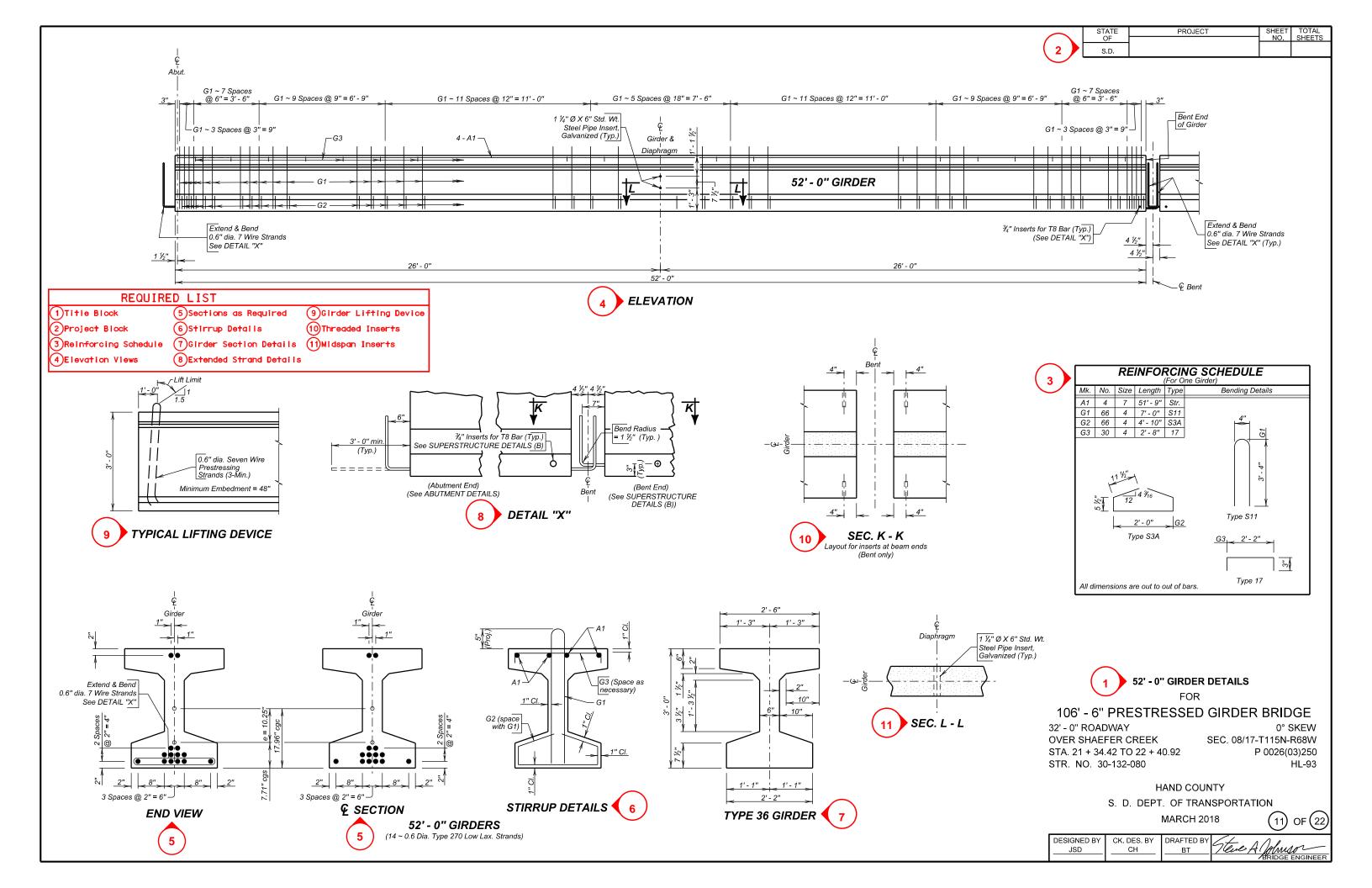


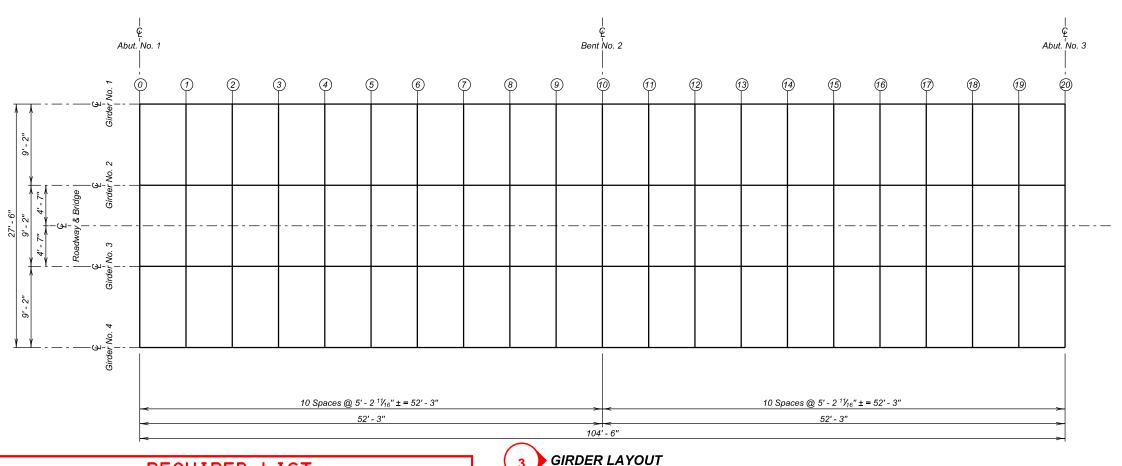
PROJECT

TOTAL SHEETS

HL-93







REQUIRED LIST

(4)Elevation Calculations Table

(2)Project Block (5)Haunch Detail and Notes

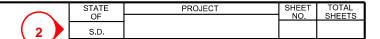
(3)Plan View

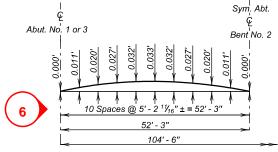
1)Title Block

6)Camber Diagram

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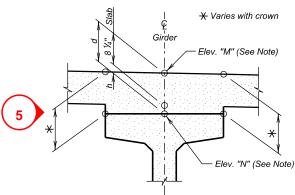
		TABLE OF SLAB FORM ELEVATIONS AND CALCULATIONS																				
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Elev. "M"	1512.842	1512.786	1512.728	1512.670	1512.611	1512.549	1512.485	1512.419	1512.352	1512.284	1512.215	1512.170	1512.123	1512.075	1512.027	1511.975	1511.922	1511.867	1511.811	1511.753	1511.695
7	(-) Elev. "N"																					
ge.	(=) d																					
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	Elev. "M"	1513.026	1512.969	1512.912	1512.853	1512.794	1512.732	1512.669	1512.603	1512.536	1512.468	1512.399	1512.353	1512.306	1512.259	1512.210	1512.158	1512.106	1512.050	1511.994	1511.937	1511.878
2	(-) Elev. "N"																					
<i>а</i>	(=) d																					
Ö	(-) 0.688																					
	(=) h																					
	Elev. "M"	1513.026	1512.969	1512.912	1512.853	1512.794	1512.732	1512.669	1512.603	1512.536	1512.468	1512.399	1512.353	1512.306	1512.259	1512.210	1512.158	1512.106	1512.050	1511.994	1511.937	1511.878
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	Elev. "M"	1512.842	1512.786	1512.728	1512.670	1512.611	1512.549	1512.485	1512.419	1512.352	1512.284	1512.215	1512.170	1512.123	1512.075	1512.027	1511.975	1511.922	1511.867	1511.811	1511.753	1511.695
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CAMBER DIAGRAM

The Camber shown is the amount which has been added to the theoretical slab elevations to get slab elevations shown in the table of Slab Form Elevations and Calculations. Camber shown is for D. L. of slab, traffic barrier, and haunch, but does not include D. L. of beams.



NOTE -

The table contains the information necessary to determine the depth of concrete over the girders at points shown. Calculations may be carried in the spaces provided. Elev. "M" is the design elevation of the top of slab before any concrete has been poured. This elevation includes correction for camber and dead load deflection. Elev. "N" is a field measured elevation taken on top of girders at the points shown with the girders in their positions. This elevation must be taken after erection is completed, but prior to placing any of the concrete. Girders shall not be supported between bearings when elevations are taken.

NOTE -

Based on a "d" of 10" at the \$\hat{\Phi}\$ of each abutment and 10" at the \$\hat{\Phi}\$ of the Bent (see SEC. C - C on SUPERSTRUCTURE DETAILS (B), it is anticipated that the midspan haunch dimension "h" over the \$\hat{\Phi}\$ of each girder will be \$1 \frac{\Phi}{2}\$. If when computing the dimensions in the table, it is found that any dimension "h" is less than zero or greater than \$4"\$ the Office of Bridge Design of the South Dakota Dept. of Transportation shall be notified immediately. After the "Table of Slab Form Elevations and Calculations" has been completely filled out and approved for deck forming, a copy shall be forwarded to the Office of Bridge Design for review and analysis for the purpose of securing information relative to camber growth in the beams. This information is necessary for preparing plans for future structures of this type.

1

ERECTION DATA AND SLAB FORM ELEVATIONS

FOR

106' - 6" PRESTRESSED GIRDER BRIDGE

32' - 0" ROADWAY OVER SHAEFER CREEK STA. 21 + 34.42 TO 22 + 40.92

STR. NO. 30-132-080

0° SKEW SEC. 08/17-T115N-R68W P 0026(03)250 HL-93

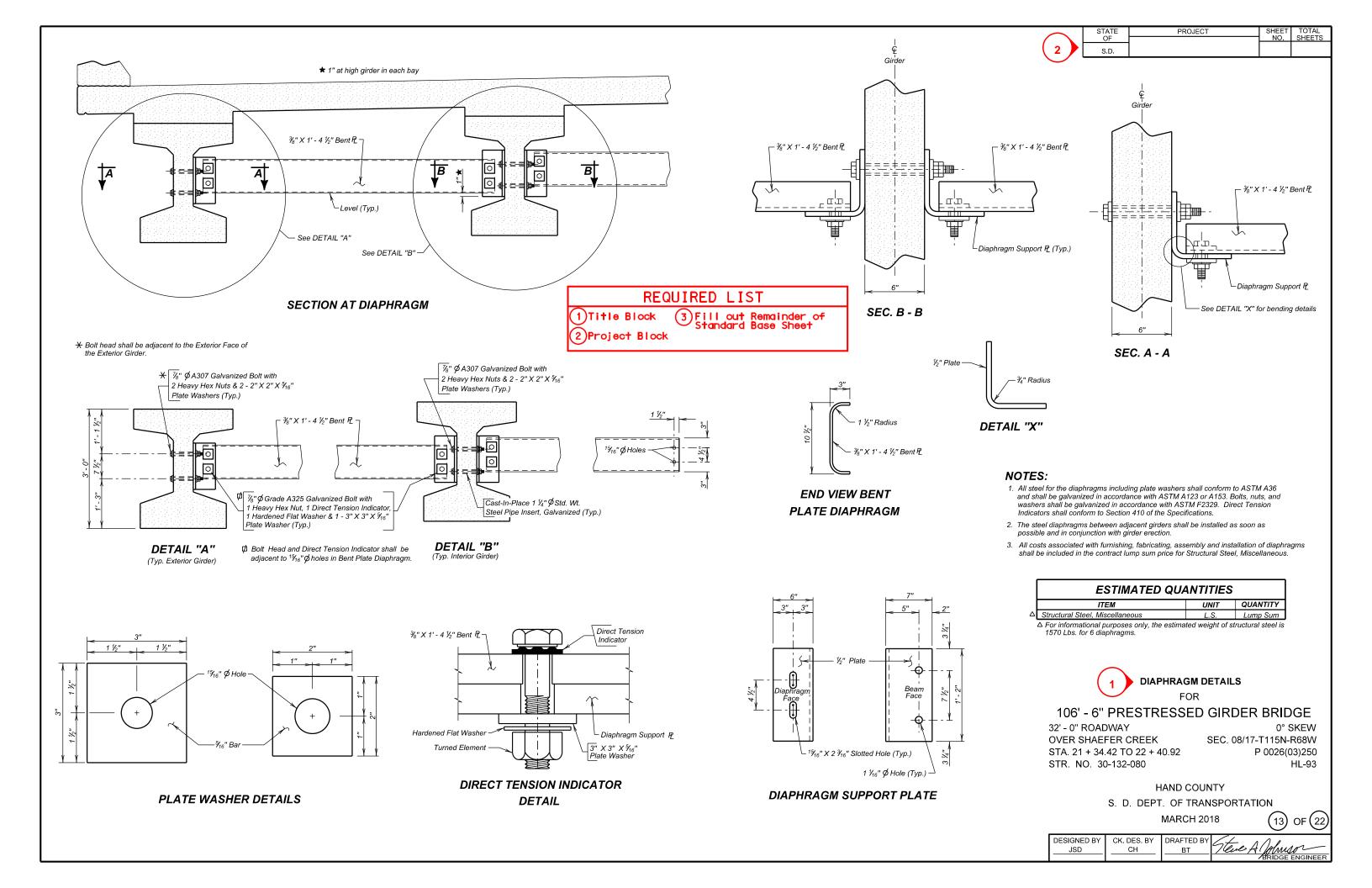
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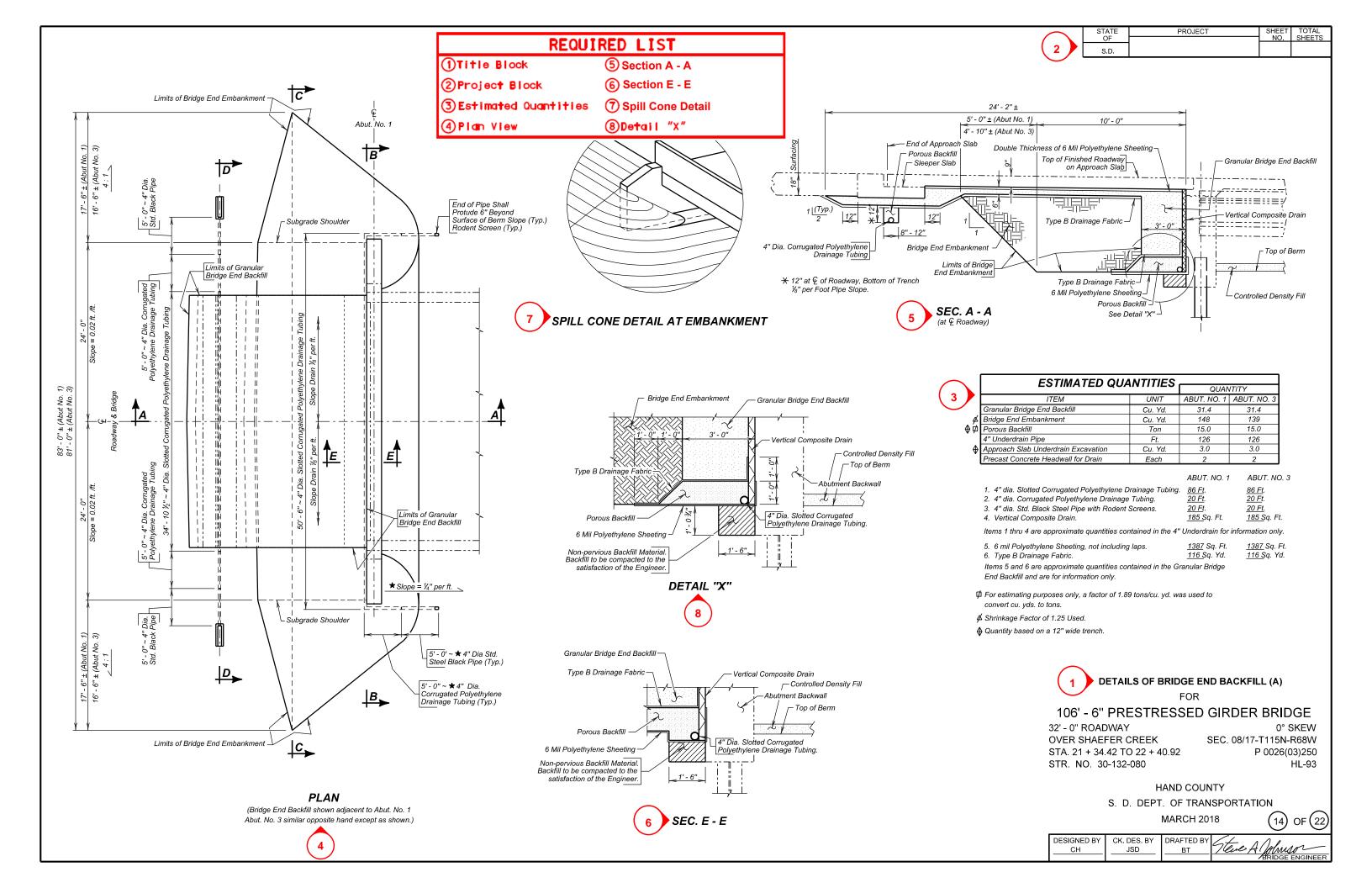
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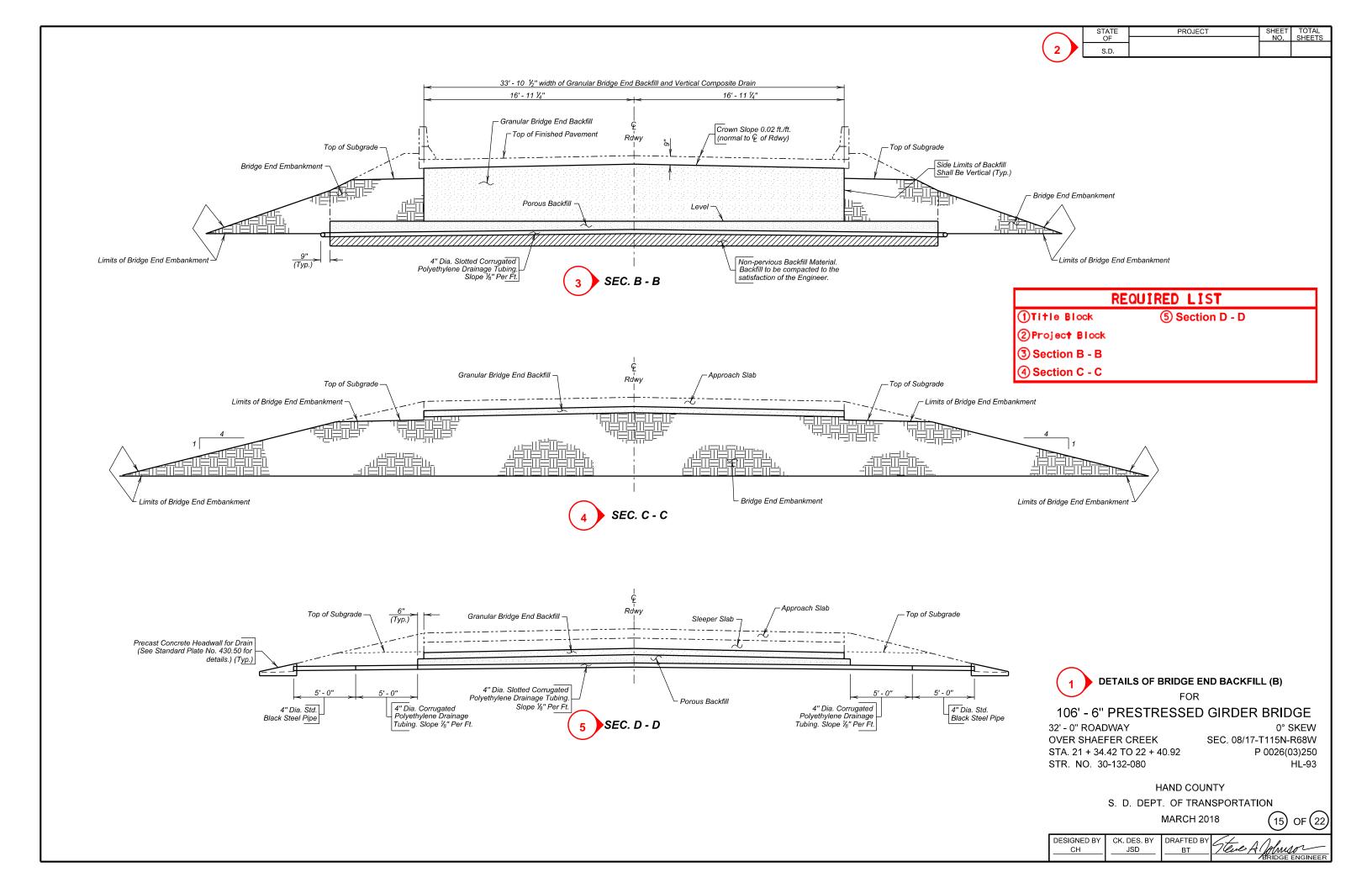
MARCH 2018

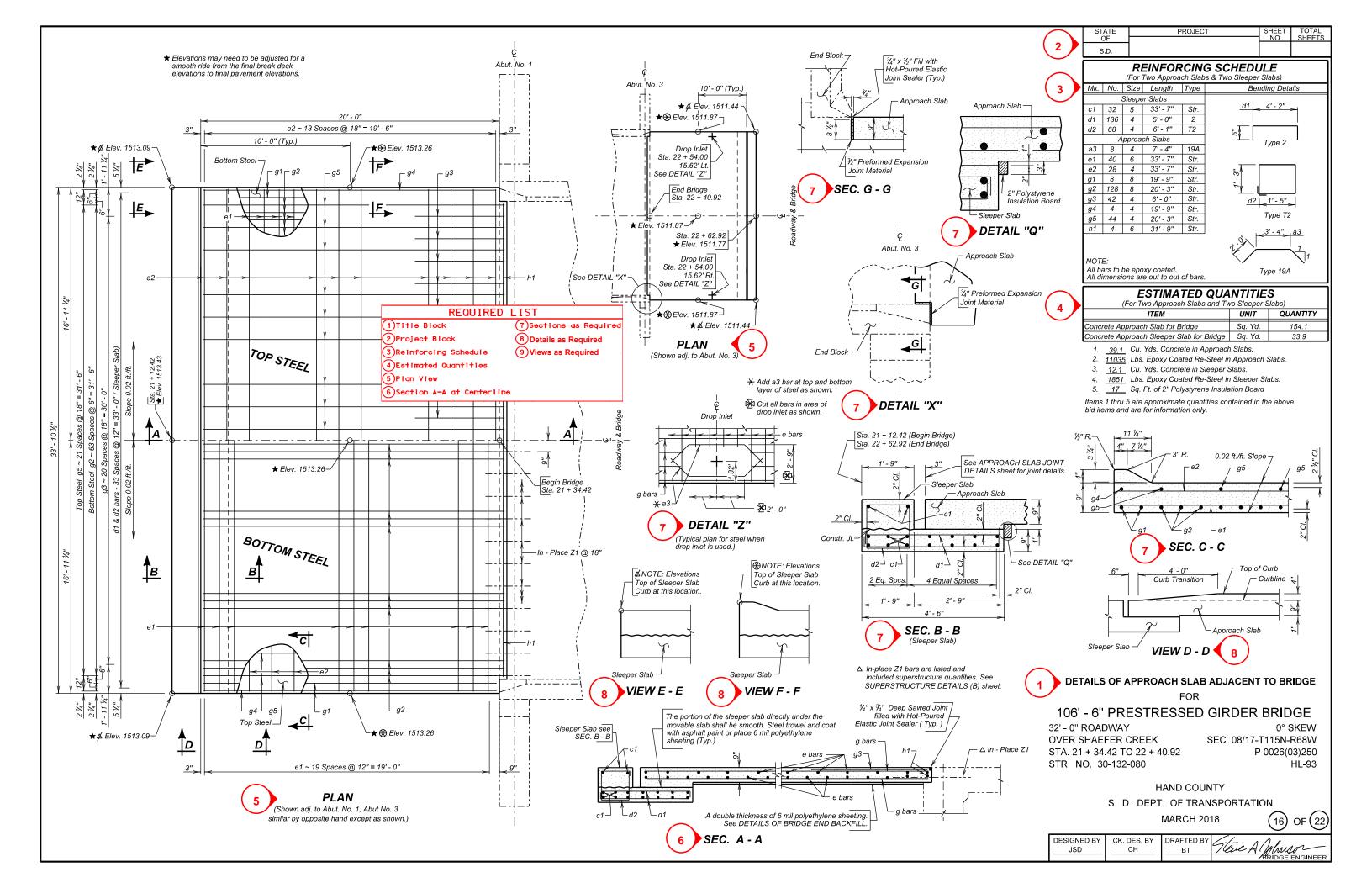


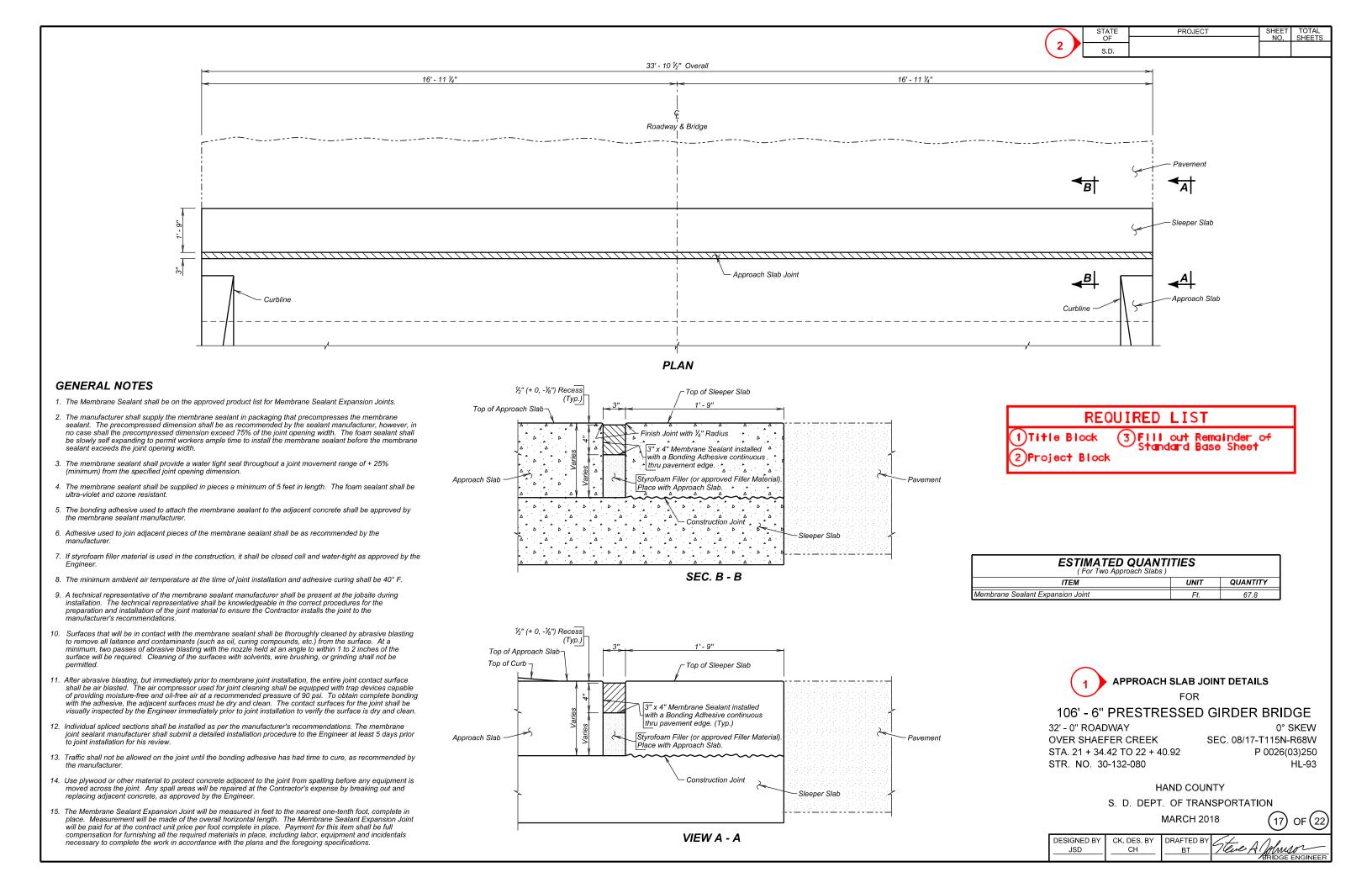
DESIGNED BY JSD	CK. DES. BY CH	DRAFTED BY BT	Steve A Johnson
	-		BRIDGE ENGINEER

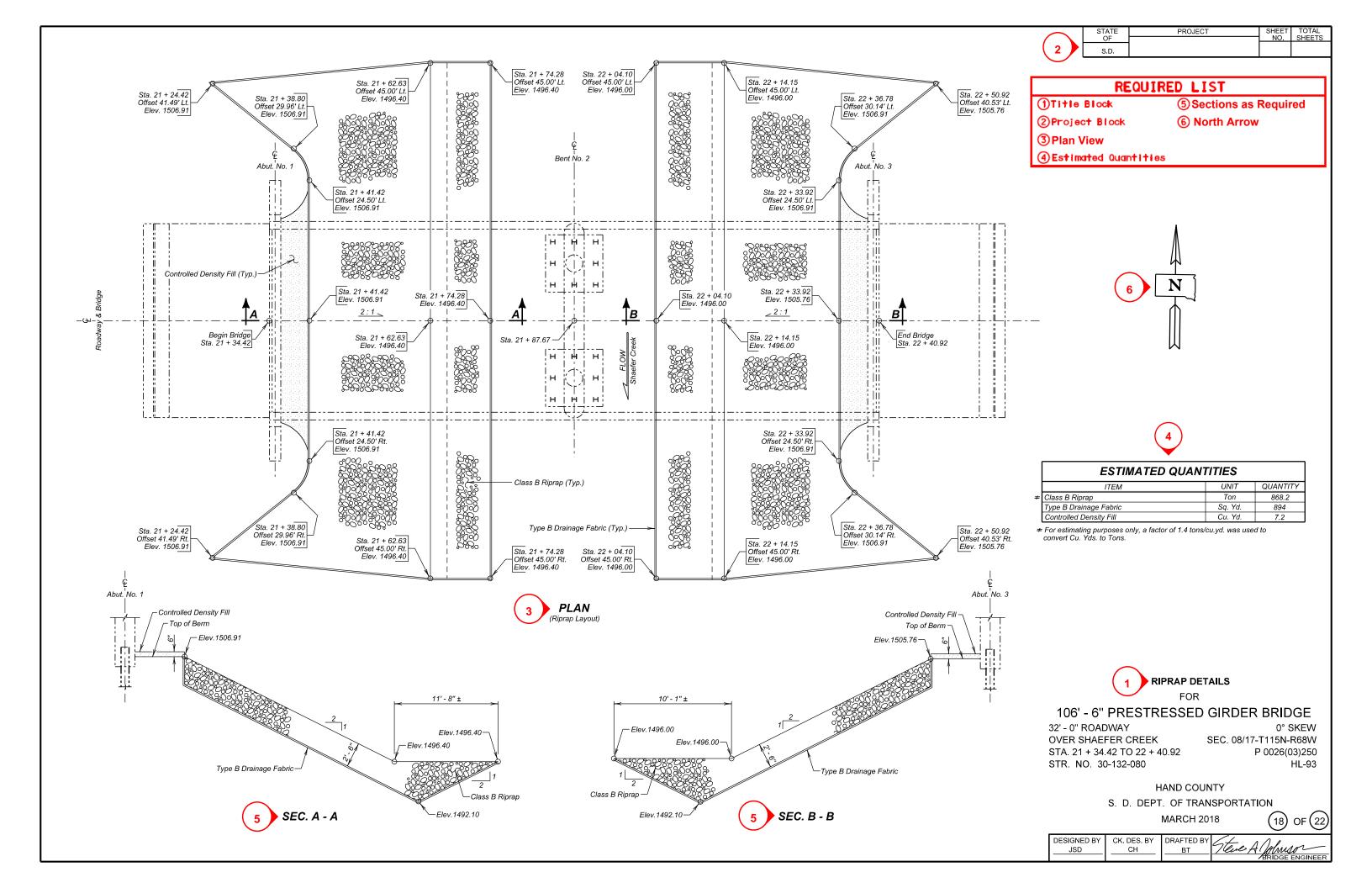


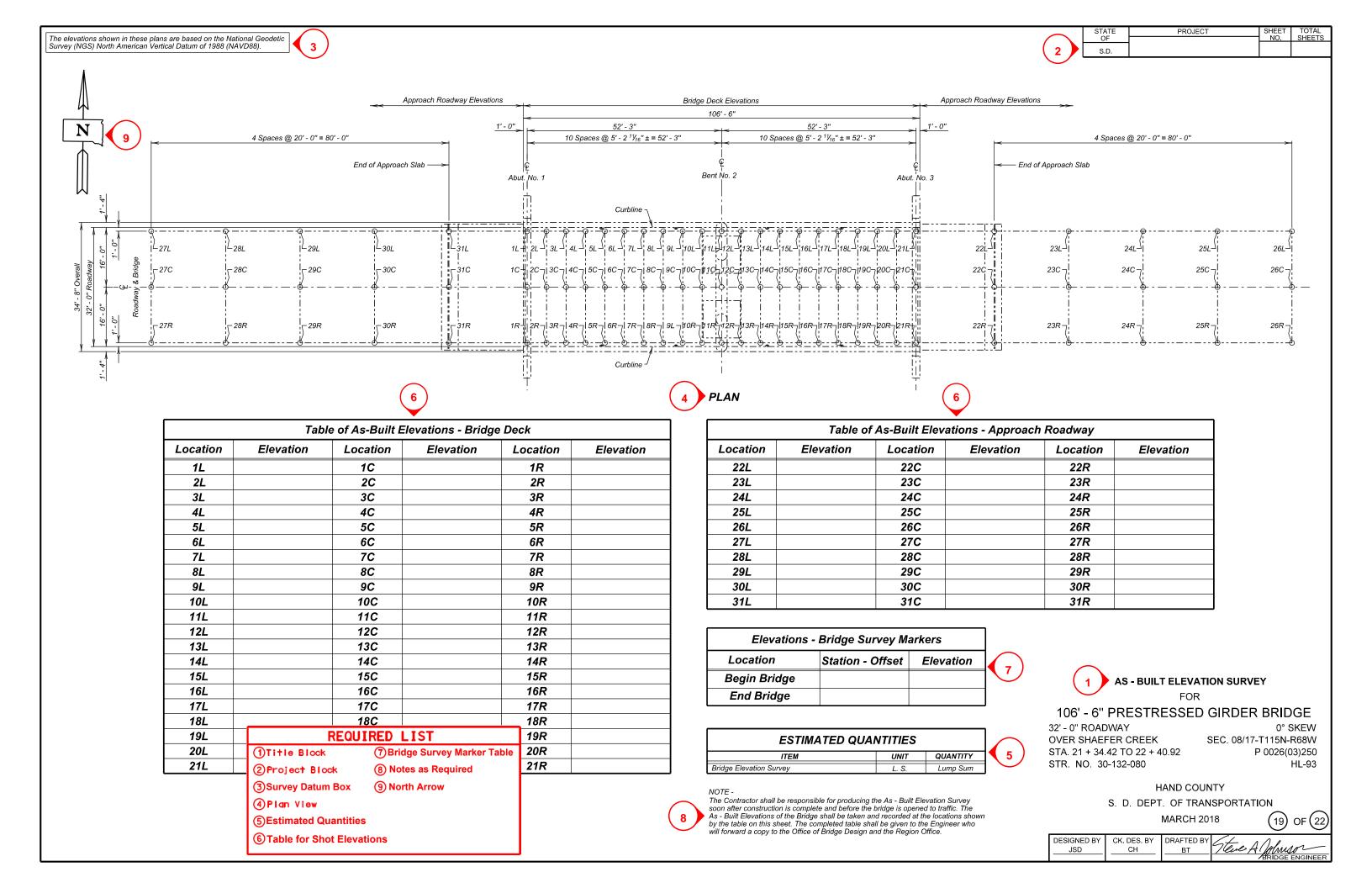






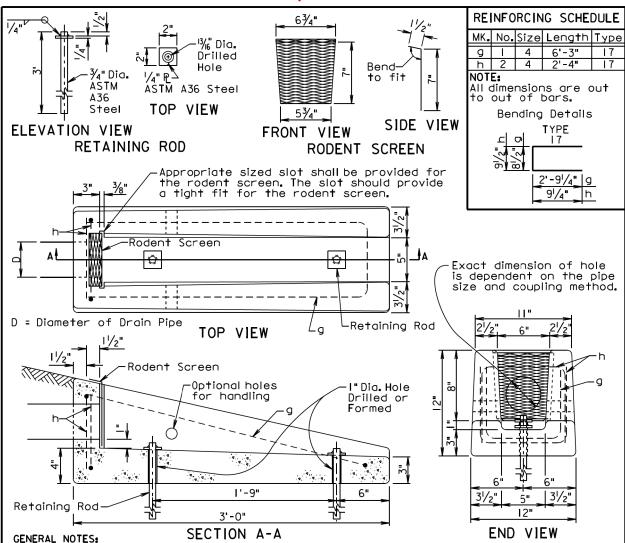






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PROJECT



The concrete shall be Class M6. The concrete shall conform to the requirements of Section 462 of the Specifications. It is estimated that each unit weighs approximately

All reinforcing steel shall conform to ASTM A615 Grade 60 and shall be epoxy coated. The reinforcing steel shall be securely retained to prevent displacement during placement of concrete. It is estimated that 7.3 pounds of reinforcing steel is required for each unit.

The pipe shall be placed in the concrete headwall with the pipe end flush with the concrete surface adjacent to the rodent screen.

The rodent screen shall be galvanized 13 Ga steel with a diamond shaped flattened mesh pattern. The size shall be $\frac{1}{2}$. The size refers to the measurement across the smallest diamond shaped opening measured from the centers of the wires.

The retaining rod shall be galvanized in accordance with ASTM Al23 after all shop welding has been completed.

The drawing indicates using $\frac{1}{2}$ fillets; however, $\frac{3}{4}$ chamfers may be substituted for the 1/2" fillets.

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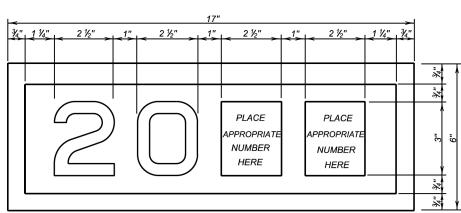
All costs for furnishing and installing the concrete headwall including equipment, labor, and materials including concrete, reinforcing steel, retaining rods, and rodent screen shall be incidental to the contract unit price per each for "Precast Concrete Headwall for Drain".

Published Date: 1st Qtr. 2019

PRECAST CONCRETE HEADWALL FOR DRAIN

PLATE NUMBER *430.50*

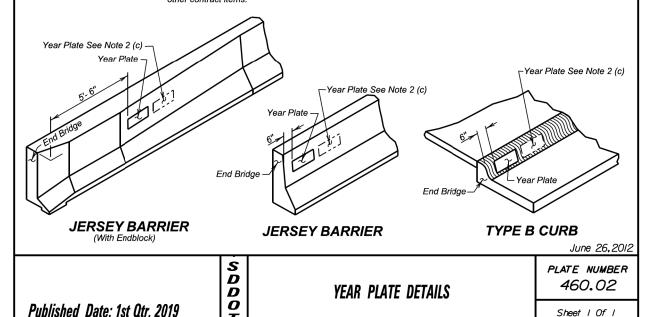
Sheet Lof L



YEAR PLATE DETAILS

GENERAL NOTES:

- 1. Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (1/2) inch in depth.
- 2. Year plates shall be located on structure (s) as follows:
- a. On cast-in-place box culverts the year plates shall be four and one half (4 1/2) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate shall be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with this location, the year plate shall be centered in an adjacent barrel.
- b. On bridges with six (6) inch curbs or "Jersey" shaped barriers with no endblocks, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier endblocks, the year plate shall be centered on the upper sloped portion of the barrier approximately 5'- 6" from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.
- c. When the plans specify that both the original date of construction and the date of reconstruction are to be shown, one date shall be placed as listed above and the other located adjacent to it. Both year plates shall be shown at each end of the bridge on opposite sides.
- There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.



REQUIRED LIST

3 Insert Required Standard Plate Sheets as Needed (1)Title Block 2)Project Block



106' - 6" PRESTR. GIRDER BRIDGE

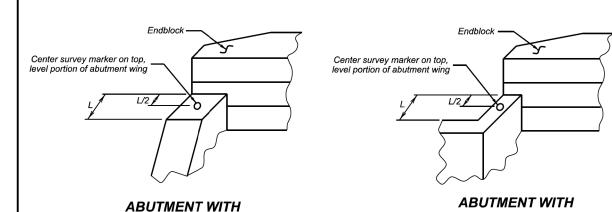
Driven portion of pile to be cut off

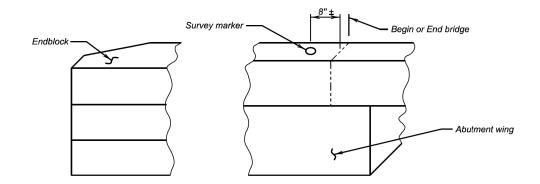
square if burred from driving.

PROJECT S.D.

1" R. Cope (Typ.)

See Table 1 for backing plate size





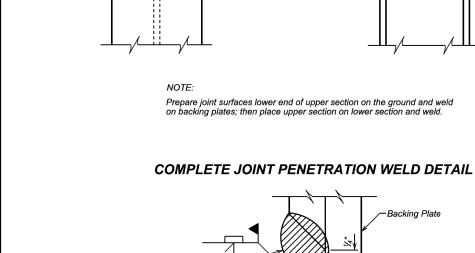
ABUTMENT WITH "SWEPT BACK" WINGS

(Endblock on top of wings)

GENERAL NOTES:

"STRAIGHT" WINGS

- 1. Survey markers shall be located at each abutment on the same side of the bridge as the year plate. Place survey markers on abutment wings as shown. Two survey markers will be required at each bridge.
- 2. Survey markers shall be of a type intended for installation in concrete, be made of solid brass or bronze, have a domed top and be either a 3" top diameter (with a ¾" X 2" long ribbed shank), or a US Army Corps of Engineers Type C Disc with a 3 1/2" top diameter.
- 3. There will be no separate measurement or payment made for survey markers. All costs for this work shall be incidental to the other contract items.



GENERAL NOTES:

See Table 1 for

backing plate size

- 1. Steel for backing plates shall conform to ASTM A709 Grade 50.
- Welding and weld inspection shall be in conformance with AWS D1.5 (Current Year) Bridge Welding Code Steel.
- 3. Welder must be certified and registered with the SDDOT.
- Backing plate shall at a minimum be as thick as the web of the pile being spliced.
- 5. Web must be coped with 1 inch radius.
- 6. Submit Welding Procedure Specification (WPS) to Bridge Construction Engineer for approval prior to pile driving.

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TABLE 1 (BACKING PLATES)								
PILE	10"	12"	14"					
"F" FLANGE	6 ½"	8"	10"					
"W" WEB	4 ¾"	6 1/4"	7 ½"					

Published Date: 1st Qtr. 2019

STEEL PILE SPLICE DETAILS

PLATE NUMBER *510.40*

Sheet I of I

December 23,2012

S D D **O T**

Published Date: 1st Qtr. 2019

BRIDGE SURVEY MARKER

460.05 Sheet I of I

PLATE NUMBER

June 26,2012

"SWEPT BACK" WINGS

REQUIRED LIST

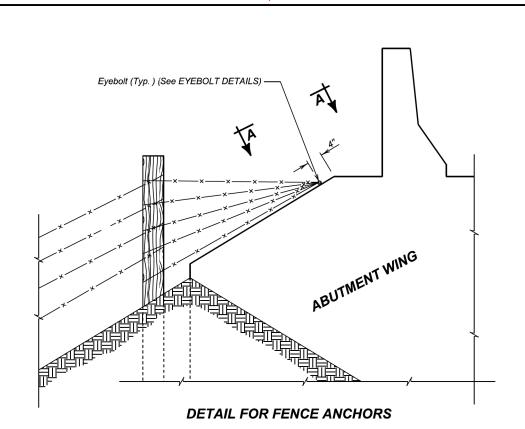
3 Insert Required Standard Plate Sheets as Needed (1)Title Block (2)Project Block



106' - 6" PRESTR. GIRDER BRIDGE

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PROJECT S.D.

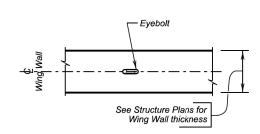


GENERAL NOTES:

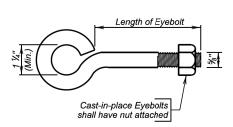
- 1. The fence and post details shown are for illustrative purpose only. The fence shall be as specified elsewhere in the plans.
- 2. Eyebolts shall be placed on all of the bridge abutment wings.
- 3. Eyebolts shall be ⅓ inch diameter and shall conform to ASTM A307.
- 4. Eyebolts, nuts, and concrete inserts shall be galvanized in accordance with AASHTO M232 (ASTM A153). Concrete inserts of corrosion resistant material need not be galvanized.
- 5. Cast-in-place eyebolts shall have a nut attached, be 4 $\frac{1}{2}$ inches (Min.) in length and shall be embedded such that the eye of the bolt is flush with the concrete surface. (See Eyebolt Details) As an alternate, cast-inplace concrete inserts, capable of developing the full strength of the % inch diameter threaded eyebolt, may be used and shall be set in the concrete in accordance with the manufacturer's recommendations. The eyebolt shall be of sufficient length to develop its full strength. The eye of the eyebolt shall be flush with the concrete surface.
- 6. The cost for furnishing and installing eyebolts and/or concrete inserts shall be incidental to various contract items.

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VIEW A - A



EYEBOLT DETAILS

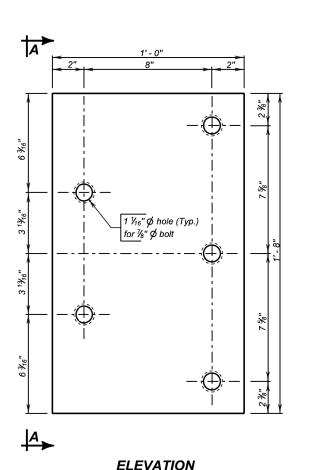
December 23,2012

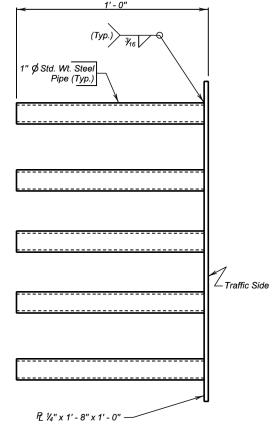
Published Date: 1st Qtr. 2019

FENCE ANCHORS FOR BRIDGE ABUTMENT WINGS (WINGS 6' AND SHORTER)

PLATE NUMBER 620.18

Sheet I of I





VIEW A - A

GENERAL NOTES:

Published Date: 1st Qtr. 2019

- Steel plate for the insert assembly shall conform to ASTM A709 Grade 36. The steel pipes shall conform to ASTM A53 or ASTM A500 Grade B.
- 2. Welding and weld inspection shall be in conformance with AWS D1.1 (Current Year) Structural Welding Code Steel.
- 3. After fabrication, galvanize in accordance with AASHTO M111 (ASTM A123).
- Bolts, nuts, and washers shall be provided with each assembly. Bolts shall be galvanized and conform to the requirements of ASTM A307, A325, or A449. Plain washers shall be galvanized and conform to ASTM F844.
- Bolt heads shall be placed on the traffic side of the endblock. Bolt projection at the back side of the insert shall not exceed 1 inch beyond the nut.
- 6. The cost of the 5 bolt insert plate assembly complete in place including welding and galvanizing shall be incidental to the contract unit price per Cubic Yard for "Class A45 Concrete, Miscellaneous", "Class A45 Concrete, Bridge Deck", or "Class A45 Concrete, Bridge Repair", as applicable.

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5 BOLT INSERT PLATE ASSEMBLY

PLATE NUMBER 630.92

December 23,2013

Sheet I of I

(22) OF (22)

REQUIRED LIST

3 Insert Required Standard Plate Sheets as Needed 1)Title Block (2)Project Block



106' - 6" PRESTR. GIRDER BRIDGE